

CLAIMS

What is claimed is:

- 5 1. An up-conversion modulation loop for multi-mode
mobile communication being used to perform
signal modulation and processing so as to
transmit the signal by using a single power
emitter, the loop comprising:
10 a phase modulator for receiving a feedback
signal and a modulation phase signal, and
comparing the two signal so as to generate a
difference;
a first filter for receiving the difference
15 generated by the phase modulator, and
transmitting it to a frequency divider;
a first frequency divider for receiving the

signal transmitted by the first filter so as
to perform the signal down-conversion, and
transmitting the signal to a phase frequency
comparator;

5 a phase frequency comparator for receiving the
signal transmitted by the first frequency
divider and a second down-conversion signal so
as to compare the signal phases, and
transmitting the signal to a loop low-pass
10 filter;

a loop low-pass filter for receiving the signal
transmitted by the phase frequency comparator
so as to perform the signal filtering, and
transmitting the signal to a second adder;

15 a second adder for receiving the signals
transmitted by the loop low-pass filter and a

signal amplifier so as to synthesize the signals,
and transmitting the synthesized signal to a
voltage controlled oscillator;
a voltage controlled oscillator for receiving
5 the signal transmitted by the second adder so
as to perform the signal modulation and make
the phases of the input signal and the output
signal consistent, and outputting the signal
to a power amplifier for signal emitting;
10 a phase detector for receiving the modulation
phase signal so as to detect the signal phase;
a signal amplifier for receiving the detection
signal transmitted by the phase detector and
the signal outputted by a signal transmitter
15 so as to perform the signal amplifying, and
transmitting the amplified signal to the second

adder;

a signal transmitter for receiving the difference transmitted by the phase modulator, and transmitting it to the signal amplifier;

5 wherein the multi-mode signal modulation is accomplished and the modulated signal is transmitted to the next level processing unit for signal emission.

2. The up-conversion modulation loop of claim 1,

10 wherein the phase modulator comprises:

a phase converter for receiving the feedback signal, and performing the phase generation so as to output a in-phase feedback signal and a quadrature phase feedback signal;

15 a first mixer for receiving the in-phase feedback signal outputted by the phase

converter and a first modulation phase signal
outputted from outside of the phase modulator,
and then performing the mixing so as to
outputting the mixed signal to a first adder;
5 a second mixer for receiving the quadrature
phase feedback signal outputted by the phase
converter and a second modulation phase signal
outputted from outside of the phase modulator,
and then performing the mixing so as to output
10 the mixed signal to the first adder;
a first adder for receiving the mixed signals
outputted by the first mixer and the second
mixer, and then performing the signal comparing
so as to output the signal to the first filter
15 and the signal transmitter outside the phase
modulator.

3. The up-conversion modulation loop of claim 2,
wherein the feedback signal is fed back to the
phase converter in the phase modulator after a
second filter receives the signal transmitted
5 by a third mixer and perform the frequency
filtering.
4. The up-conversion modulation loop of claim 3,
wherein the third mixer is used for receiving
the signal outputted by the voltage controlled
10 oscillator, and mixing it with a first
down-conversion signal so as to transmit the
mixed signal to the second filter.
5. An up-conversion modulation loop for multi-mode
mobile communication being used to perform
15 signal modulation and processing so as to emit
the signal by using a single power emitter, the

loop comprising:

a phase modulator for receiving a feedback signal
and a modulation phase signal, and adding the
two signals so as to generate a difference;

5 a first filter for receiving the difference
generated by the phase modulator, and
transmitting it to a frequency divider;

a first frequency divider for receiving the
signal transmitted by the first filter so as to
10 perform the signal down-conversion, and
transmitting the signal to a phase frequency
comparator;

a second frequency divider for receiving a first
down-conversion signal so as to perform the
15 frequency division on the signal, and then
outputting the signal to the phase frequency

comparator;

a phase frequency comparator for receiving the
signals processed by the first frequency divider
and the second frequency divider so as to compare
5 the signal phases, and then outputting the signal
to a loop low-pass filter;

a loop low-pass filter for receiving the signal
transmitted by the phase frequency comparator
so as to perform the signal filtering, and
10 transmitting the signal to a second adder;

a second adder for receiving the signals
transmitted by the loop low-pass filter and a
signal amplifier so as to synthesize the signals,
and transmitting the synthesized signal to a
15 voltage controlled oscillator;

a voltage controlled oscillator for receiving

the signal transmitted by the second adder so
as to perform the signal modulation and make the
phases of the input signal and the output signal
consistent, and outputting the signal to a power
5 amplifier for signal emitting;
a phase detector for receiving the modulation
phase signal so as to detect the signal phase;
a signal amplifier for receiving the detection
signal transmitted by the phase detector and the
10 signal outputted by a signal transmitter so as
to perform the signal amplifying, and
transmitting the amplified signal to the second
adder;
a signal transmitter for receiving the
15 difference transmitted by the phase modulator,
and transmitting it to the signal amplifier;

a signal amplitude detector for receiving the modulation phase signal so as to detect the signal amplitude, and outputting it to the power amplifier;

5 wherein the multi-mode signal modulation is accomplished and the modulated signal is transmitted to the power amplifier for signal emission.

6. The up-conversion modulation loop of claim 5,

10 wherein the phase modulator comprises:

a phase converter for receiving the feedback signal, and performing the phase modulation so as to output a in-phase feedback signal and a quadrature phase feedback signal;

15 a first mixer for receiving the in-phase feedback signal outputted by the phase converter and a

first modulation phase signal outputted from
outside of the phase modulator, and then
performing the mixing so as to outputting the
mixed signal to a first adder;

5 a second mixer for receiving the quadrature
phase feedback signal outputted by the
phase converter and a second modulation
phase signal outputted from outside of the
phase modulator, and then performing the
10 mixing so as to output the mixed signal to
the first adder;

a first adder for receiving the mixed
signals outputted by the first mixer and
the second mixer, and then performing the
15 signal comparing so as to output the signal
to the first filter and the signal

transmitter outside the phase modulator.

7. The up-conversion modulation loop of claim

6, wherein the feedback signal is fed back

to the phase converter in the phase

5 modulator after a second filter receives

the signal transmitted by a third mixer and

perform the frequency filtering.

8. The up-conversion modulation loop of claim

7, wherein the third mixer is used for

10 receiving the signal outputted by the

voltage controlled oscillator, and mixing

it with a first down-conversion signal so

as to transmit the mixed signal to the second

filter.

15 9. The up-conversion modulation loop of claim

5, wherein the signal amplitude detector

further comprises a switch for detecting the amplitude of the multi-mode frequency signal.

10. An up-conversion modulation loop for the multi-mode mobile communication being used for performing the signal modulation, detection and transmission so as to integrate the global system for mobile communication (GSM) and the wideband code division multiple access (WCDMA) for signal emission, the loop performing the following steps:

transmitting a modulation phase signal wherein a first modulation phase signal and a second modulation phase signal are transmitted to a phase modulator and a phase detector, and the phase modulator is used for comparing the signals, and the phase detector is used for detecting the

phases of the two modulation phase signals;
generating a difference after the signal
comparing by the phase modulator;
transmitting the generated difference to a
5 signal transmitter and a first filter;
comparing the signal frequencies and filtering
the signals wherein the first filter transmits
the difference to a phase frequency comparator
and a loop low-pass filter so as to perform the
10 comparing and the filtering;
synthesizing the signals wherein a first adder
is used for synthesizing the signals, and
transmitting the synthesized signal to a voltage
controlled oscillator;
15 modulating the phase frequencies wherein the
voltage controlled oscillator is used for

modulating the input and output signals so as
to make the modulated phases of the output and
input signals consistent;

outputting and emitting the signal to output the

5 modulated signal with consistent phase to a power
amplifier so as to accomplish the up-conversion
modulation for the multi-mode mobile
communication.

11. The up-conversion modulation loop of claim 10,

10 wherein the voltage controlled oscillator
further outputs the signal to a third mixer, and
the third mixer is used for receiving a first
down-conversion signal from outside, and
outputting a feedback signal to a second filter,
15 and after the second filter processes the signal,
the feedback signal is outputted to the phase

modulator.

12. The up-conversion modulation loop of claim 10,

wherein the phase modulator further comprises:

5 a phase converter for receiving the feedback
signal, and performing the phase modulation so
as to output a in-phase feedback signal and a
quadrature phase feedback signal;

a first mixer for receiving the positive phase
feedback signal outputted by the phase converter
10 and a first modulation phase signal outputted
from outside of the phase modulator, and then
performing the mixing so as to outputting the
mixed signal to a first adder;

a second mixer for receiving the quadrature
15 phase feedback signal outputted by the
phase converter and a second modulation

phase signal outputted from outside of the
phase modulator, and then performing the
mixing so as to output the mixed signal to
the first adder;

5 a first adder for receiving the mixed
signals outputted by the first mixer and
the second mixer, and then performing the
signal comparing so as to output the signal
to the first filter and the signal
10 transmitter outside the phase modulator.

13. The up-conversion modulation loop of claim 10,
wherein the modulation phase signal is further
inputted into a signal amplitude detector, and
the signal amplitude detector will detect the
15 amplitude of the signal, and output the signal
to the power amplifier.